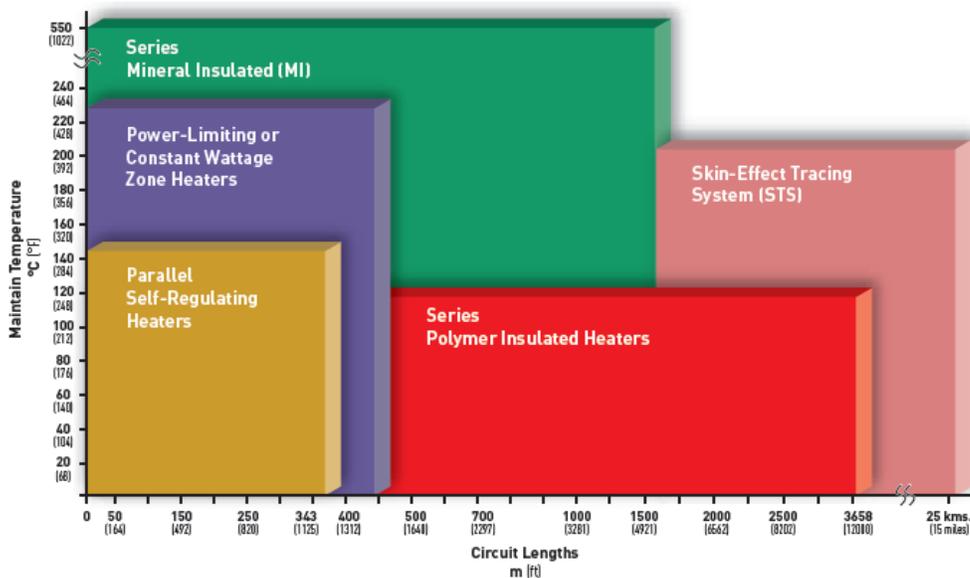


# 5 HEAT TRACING APPLICATIONS, 5 TECHNOLOGIES

Read our newest contribution to discover which goes with which.

Electric heat tracing is used in many process industries to maintain the process fluids at desired temperatures. When selecting a heat-tracing technology, it is crucial to understand the **requirements of the application** as well as each **technology's capabilities and limitations**. Let's take a look at five different types of heat-tracing applications and some of their key characteristics and requirements that can help you choose the most appropriate technology.



## 1) Freeze Protection

The main purpose of freeze protection systems is to prevent fluids such as process water, drain water and fire water lines from freezing in pipes. Your plant does not necessarily need to be in the extreme remote cold regions of the world to experience freezing temperatures. Temperatures can easily drop below 32°F/0°C overnight and put your process in jeopardy if the pipes are not properly insulated and/or heat traced.

**Parallel self-regulating technology** is ideal for this application. As the surrounding temperature decreases, the heating cable increases its current flow to provide heat to the pipe, tank, or vessel. Conversely, as the temperature increases, the heating cable reduces its current flow to provide less heat because it's not needed. This self-regulating behavior is important for freeze protection applications because it enables

**energy efficient and cost effective solutions** for freeze protection, while also resulting a more **uniform pipe temperature** than other technologies.

A **cut-to-length feature** enables a true off-the-shelf offering for your urgent needs.

## 2) Process Temperature Maintenance with no steam exposure

With process temperature maintenance applications, there's usually a need for viscosity control of certain fluids such as fuel oils, acids, and fertilizers at higher temperatures beyond freeze protection applications. These maintain temperature requirements typically range from 140°F – 230°F (60°C – 110°C). **Self-Regulating technology** can still be used in this case. However, since the maintain temperatures are higher; the **heat losses are high** in these applications.

Hence, you want to be able to choose a cable that meets the temperature requirement and provides **more power output** of up to 10, 15, or even 20 watts per foot. This will allow you to have less runs of cables while producing more heat for your application.

## 3) Freeze Protection and Process Temperature Maintenance with steam exposure

There are some freeze protection and process temperature maintain applications where the heat-trace cable gets exposed to higher temperatures than the maintain temperature. This can occur in the short term, when steam is used to clean the pipes, but also in the longer term for some applications.

**Self-Regulating technology** is still a preferred method of heat tracing in this case as it provides all the benefits mentioned earlier as well as results in lower cable sheath temperatures which is critical for hazardous area applications. You should be able to specify a cable with maintain temperatures up to 300°F (150°C) and maximum exposure temperature of 482°F (250°C). The key is for the cable to be able to withstand the higher steam temperatures. With high maintain temperature applications (e.g. Sulphur, crudes and lubes) **power-limiting heaters** could be a good choice. These heaters have some of the same characteristics of self-regulating but add higher maintain temperature up to 455°F (235°C) and exposure temperature capabilities up to 500°F (260°C) with power off.

## 4) Very High Temperature Heat Tracing

Some applications such as asphalt or bitumen have a requirement for very high maintain temperatures. Mineral Insulated (MI) technology is ideal for such applications as the cable can withstand maintain temperatures up to 1022°F/550°C and exposure temperatures up to 1200°F (650°C). MI construction consists of conductors embedded in a highly dielectric magnesium oxide insulation surrounded by a seamless metal sheath. This allows the cable to be rugged and to withstand harsh environments and cold climates. Power outputs can go as high as 61 watts/ft.

## 5) Long line Heating

Long line heat-tracing applications are required when circuit lengths from 1000 ft/300 m up to several miles/kilometers are powered from a single power point. They are needed to heat long pipelines for freeze protection or for viscosity control/temperature maintenance of certain fluids. Applications include transfer

lines between processing plants, storage facilities needing to transfer product to and from tank farms, or loading and unloading facilities at piers for ocean transport vessels or at depots for rails and trucks.

Long line heat tracing systems are typically **engineered systems** and there are many variables that can be customized to provide the most cost-effective and reliable solution for your specific application. Therefore, **Skin-effect heat-tracing systems (STS)** are ideally suited for extremely long pipelines. STS is a custom engineered heat management system that can be designed for circuit lengths up to 25 kilometers (15 miles), power outputs up to 150 watts/m (49.2 watts/ft.), and able to withstand maintain temperatures up to 392°F (200°C) with exposure temperatures up to 480°F (250 °C). **Self-regulating** products are also available that can be used for long line heating but they are limited to few thousand feet of circuit lengths. **Polymer insulated series cables** can also be used up to 12,000 ft. of circuits. They offer advantage of field terminations, flexibility and high maintain/exposure temperatures.

The key point is to avoid limiting your options by specifying one particular type of technology for all applications. Understanding what your application requirements are will help you choose the most suitable heat-tracing technology, designed for your specific application.



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